

Book Reviews

THE ANTHROPOLOGY OF MODERN HUMAN TEETH: DENTAL MORPHOLOGY AND ITS VARIATION IN RECENT HUMAN POPULATIONS. By G. Richard Scott and Christy G. Turner II. New York: Cambridge University Press. 1997. 382 pp. ISBN 0-521-45508-1. \$80.00 (cloth).

As its prologue notes, a large portion of the database presented in this book is the product of over 30 years of research by the authors (primarily the second) and others who have been associated with the Arizona State University at Tempe (ASU) dental anthropology program. The main topics of this book are the description, classification, comparison, and synthesis of non-metric dental variation. It assembles information on more than 30 permanent tooth crown and root traits observed in living and recently living humans; probably the largest such compilation of its kind. Although a mammoth undertaking by any standard, closer scrutiny reveals a few deficiencies in an otherwise much welcomed addition to the literature on dental anthropology.

The book opens with a rather lengthy prologue (pp. xii-xxiii)—an obvious attempt to entice the reader into the fascinating world of dental anthropology. Unfortunately, the few selected examples of tooth ablation and other forms of dental alteration presented here have little or nothing to do with the main topic of this book, a survey of genetically inherited dental morphological variation. The remainder of the book follows a more logical trajectory which includes a brief history of dental morphological studies (Chapter 1), a detailed description and classification of 35 non-metric dental traits used at ASU (Chapter 2), the biological (Chapter 3), and the genetic (Chapter 4) underpinnings of dental morphology, a portrayal (Chapter 5) of dental morphological variation on a world scale, methods and theory (Chapter 6) for using tooth morphology in historical reconstructions, and a synthesis

of these data (Chapter 7) for assessing the relationships (and possible origins) of living, or recently living, human groups on a regional and then global scale. A short epilogue outlining what the authors feel are some of the promising areas of future research in dental anthropology rounds out the book.

One of the major strengths of the book is its detailed description and classification of 35 dental crown and root traits (Chapter 2) amply illustrated with good quality photographs. The section on the methods of observation in the same chapter is less thorough and, as is the case with the next two chapters, there is some redundant and extraneous discussions (e.g., Zubov's work on odontomers, etc.) which makes for arduous reading. A few details are seemingly glossed over. For example, how can root traits be observed, with the unaided eye in a non-destructive manner, if the teeth are securely anchored in their sockets? The chapter on the biology of teeth (Chapter 3), including ontogeny, asymmetry, sex dimorphism, and intertrait association, while helpful, is again very dense reading, containing portions more appropriately discussed in an oral/dental anatomy textbook. The discussions and arguments for using per individual (preferred by the authors) vs. per tooth frequencies, and the lack of associations among the dental non-metric traits and between tooth size and crown traits revealed some expected biases.

The chapter on the genetics of dental morphological traits (Chapter 4) is equally verbose. While there is little doubt that dental non-metric traits are inherited, evidence is presented which suggests that some are probably more strongly controlled by genes than others. This raises some interesting questions regarding final trait selection and whether root traits, for example, perform as well as crown traits in population comparisons. Also, since most of the data presented in this book are recorded by a single individual over a considerable period of time, more discussion of intraobserver error, rather than interobserver error, would

seem appropriate. While it is obvious that these last two chapters have been included as a guide to the selection of the dental non-metric traits which are later described and compared, the final paragraph of this chapter reveals that the final choice may depend more on experience than any other considerations.

The mainstay of the book (Chapter 5), and quite likely its forte, is the portrayal of dental morphological variation on a world scale presented in the form of bar graphs which plot the mean frequencies (these latter are also presented in an appendix) for 21 samples, representing the five major subdivisions. I would like to have seen the individual ranges and standard errors for these data in an appendix as well. Additional mean frequencies for these traits, when available, are taken from the literature and presented in tables. Although much useful information is contained in this chapter, the authors' sampling strategy, which divides all humanity into five major subdivisions and 21 regional groups, is reminiscent of anthropology's earlier concern with racial classification. Further, there is considerable lumping of the samples, even in the regional groupings (e.g., China-Mongolia, Southeast Asia, etc.). The sample labeled "recent Southeast Asia" contains such a plethora of different specimens from mainland and insular Southeast Asia (including some representing ethnic minority groups) that the biological meaning and contents of this group are almost incomprehensible. Likewise, other regional samples, e.g., Melanesia, New Guinea, and Micronesia, are highly suspect given the enormous variation exhibited by the inhabitants of these regions. "Prehistoric Southeast Asia" contains archaeological specimens (one series identified as Ban Na Di should read Non Nok Tha) from such wide spatial and temporal horizons that, again, little meaning can be attached to them. A bit more information on the contents of each sample is given in Appendix A, but the exact specimens used, sample sizes of each series, and other important information which would help explain what is being compared are not given. Although supplemented to a degree with data taken from the literature, some regions of the world (e.g.,

Australia, Near East, Western Asia, South Asia) are not well represented. Further, a few of these traits (e.g., odontomes, two-rooted lower canines) appear to be so infrequent worldwide that their inclusion in later analyses is questioned. The chapter ends with the provocative claim that "a handful of teeth" could solve the timing of the major peopling events in human prehistory!

Likewise, in Chapter 6, while reviewing the literature which suggests otherwise, the authors overstate their case that no significant adaptive changes in dental morphology have occurred in the last 20,000 years. Still, the basic premise that dental morphology can be used to reconstruct population history remains tenable. One of the major weaknesses of this chapter, however, is the discussion of biological distance statistics. The authors' suggestion that it does not matter which distance statistic is used to analyze non-metric data should be carefully re-evaluated. Later (p. 288), readers are encouraged to use their "favorite distance statistic" to re-analyze the data they have presented. Unfortunately, the data are not presented in a way which allows this since most distance statistics require affected/observed values. The latter are not provided. Readers will also wonder why, after using one of the most widely used distance statistics for analyzing percentage-frequency data in their previous research, the authors abandon it for another one initially designed to analyze gene frequencies when they present their new synthesis in the last chapter. Further, the authors correctly advise against comparing distances based on different methods and variables, yet distances based on genetic and dental traits (p. 262) are later compared to bolster their argument that there is less variability in the latter. There is almost no discussion of what effect, if any, uneven sample sizes and different subsets of the original 21 traits might have on these different measures of distance, nor if tests of significance of distances based on non-metric traits were applied.

In the final chapter (Chapter 7) the authors synthesize the dental non-metric data presented in previous chapters. The Sundadonty/Sinodonty dichotomous characterization of Asian dental morphology and its

implications for understanding the later settlement of Japan, the peopling of Polynesia and the Americas, and the explanation of Australian Aboriginal dental morphology, while arguably simplistic, are summarized here. The last half of this chapter (global analysis) which presents the results of three new analyses of dental non-metric traits, apparently for the first time, should be viewed as a "work-in-progress" and would have benefited from some "peer review cleansing" in a refereed journal before being presented here. Several incredible associations, staunchly defended by the authors, caught this reviewer's eye, such as the placement of Polynesians in the same cluster with Australian Aborigines, Africans, and Europeans, and one of the biggest oddities, New Guinea's affinity to Western Eurasia rather than with Australians and Melanesians! Given the problems of sampling alluded to earlier, these results may not be so odd. Although limited comparisons with craniometric and genetic data are made, there

are no comparisons with odontometric data in this chapter.

Only a few obvious typographical errors were spotted. One unfortunate error occurs on p. 297 where Sangvichien is misspelled and, as far as this reviewer is aware, there are no publications (in English) in 1983 for this researcher.

Overall, this is a well produced and handsome volume on dental anthropology (one of a series in the Cambridge Studies in Biological Anthropology series), which focuses on dental non-metric variation and spotlights the work of Christy Turner II and the ASU dental anthropology program. While flawed, I highly recommend it for dental anthropologists and those interested in human variation.

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GREAT APE SOCIETIES. Edited by W.C. McGrew, Linda F. Marchant, and Toshisada Nishida. New York: Cambridge University Press. 1996. 328 pp. ISBN 0-521-55494-2. \$64.95 (cloth).

This edited volume not only reflects but gives added depth to the 1994 Wenner-Gren conference, The Great Apes Revisited, held in Baja California Sur, Mexico. Forty primatologists (nearly twice as many as actually participated in the conference) contributed 21 engaging and challenging articles to this collection.

The editors draw interesting comparisons, in their introduction, between the Baja conference and its ancestral counterpart held in Austria in 1974, the latter resulting in the edited volume *The Great Apes* (Hamburg and McCown, 1979). For example, they point out that at the 1974 meeting no papers discussed either bonobos or lowland gorillas, little then being known about them. Instead, most presentations were on orangutans or

the eastern subspecies of chimpanzee (*Pan troglodytes schweinfurthii*). Now, 20 years later, much has been discovered about bonobos and lowland gorillas, as well as the other two chimpanzee subspecies, while the number of orangutan studies have diminished. The editors also point out that at the first conference, prior to the emergence of other issues such as sociobiology and social cognition, "ape language" was a major topic. In addition, whereas past field studies were primarily surveys of natural history, such research now most often concentrates on sex and reproduction, feeding ecology, social relations, and ranging (Hebert and Courtois, 1994). Finally, the editors note how the number of women and European and Japanese participants has increased. Only Louis Leakey's three female protégés were present at the 1974 conference, while in 1994 women comprised 40% of the participants.

No book on nonhuman primates these days is complete without mention of primate conservation. Although no articles in this